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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CARTER, MICHAEL W	

ART UNIT	PAPER NUMBER
2828	

NOTIFICATION DATE	DELIVERY MODE
03/24/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

Office Action Summary	Application No.	Applicant(s)	
	10/529,199	HUHSE ET AL.	
	Examiner	Art Unit	
	MICHAEL CARTER	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 10-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 10-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Remarks

1. **Claims 8-9** are cancelled.

2. **Claims 1-7 and 10-19** remain rejected according to the office action mailed 7/16/2008. The rejection is reproduced below for the applicant's convenience.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. **Claims 1-2, 11-12, and 18-19** remain rejected under 35 U.S.C. 103(a) as being unpatentable over Koichi et al. JP Publication 58115947 (hereinafter referred to as Koichi) in view of Heffner et al. US Patent 6,265,237 (hereinafter referred to as Heffner).

6. **For claim 1**, Koichi teaches a method for generating an optical laser pulse (Po), in which a main laser ("2nd semiconductor laser", label 6) is driven with an electrical control signal (through 1, 2, and "2nd driving circuit" 7), and the optical laser pulse is generated by means of the main laser (label 6), an optical injection pulse (I) of an auxiliary laser ("1st semiconductor laser", label 4) being fed into the main laser, and the optical injection pulse (I) being generated in such a way that it arrives in the main laser at a point in time at which, on account of the control signal, the charge carrier density in the main laser has just reached or just exceeds the threshold charge carrier density ("the exciting signal of the laser 6 is synchronized with the injected optical signal")

(Abstract). Further, Koichi teaches the main laser is multimode and the auxiliary laser is single mode when not injected by the single mode laser (page 5 of translation).

Koichi does not explicitly teach the main laser is a Fabry-Perot laser or that the auxiliary laser is a DFB or a DBR laser.

However these lasers are well known in the art. See Heffner which teaches a Fabry-Perot laser is a multimode laser while a DFB laser is a single mode laser (column 1, lines 20-32). The particular laser used in Koichi does not appear critical to the operation of the device, rather it is the single and multimode nature of the lasers which is critical. Therefore it would have been obvious to one skilled in the art to substitute the known lasers of Heffner into the system of Koichi at the time the invention was made by an obvious engineering design choice.

7. **For claim 2,** Koichi teaches the optical injection pulse (I) is generated by application of an electrical auxiliary control signal (through 1, 2, and "1st drive circuit" 3), the auxiliary control signal being applied to the auxiliary laser ("1st semiconductor laser", label 4) temporally before the control signal is applied to the main laser, and the time difference between the application of the control signal to the main laser and the application of the auxiliary control signal to the auxiliary laser corresponding to the time period required by the optical injection pulse from the auxiliary laser to the main laser ("the exciting signal of the laser 6 is synchronized with the injected optical signal") (Abstract).

8. **For claim 18**, Koichi teaches the optical injection pulse and/or the optical laser pulse are generated by a semiconductor laser (Abstract, 1st and 2nd semiconductor laser).

9. **For claims 11 and 19,** Koichi teaches a device for generating an optical laser pulse having a main laser (label 6), which is driven with an electrical control signal (through 1, 2, and "2nd driving circuit" 7) and generates the optical laser pulse, and an auxiliary laser (label 4), which is optically connected to the main laser and feeds an optical injection pulse into the main laser (label 5, "optical coupling circuit), an electrical auxiliary control signal (through 1, 2, and "1st drive circuit" 3) being applied to the auxiliary laser (label 4) in such a way that its optical injection pulse arrives in the main laser at a point in time at which the charge carrier density of the main laser has just reached or just exceeds the threshold charge carrier density ("the exciting signal of the laser 6 is synchronized with the injected optical signal") (abstract). Further, Koichi teaches the main laser is multimode and the auxiliary laser is single mode when not injected by the single mode laser (page 5 of translation).

Koichi does not explicitly teach the main laser is a Fabry-Perot laser or that the auxiliary laser is a DFB or a DBR laser.

However these lasers are well known in the art. See Heffner which teaches a Fabry-Perot laser is a multimode laser while a DFB laser is a single mode laser (column 1, lines 20-32). The particular laser used in Koichi does not appear critical to the operation of the device, rather it is the single and multimode nature of the lasers which is critical. Therefore it would have been obvious to one skilled in the art to substitute the

known lasers of Heffner into the system of Koichi at the time the invention was made by an obvious engineering design choice.

10. **For claim 12,** Koichi teaches the auxiliary control signal is present at the auxiliary laser before the control signal is present at the main laser, to be precise in a manner time-offset by a time difference corresponding to the time period required by the optical injection pulse from the auxiliary laser to the main laser because "the exciting signal of the laser 6 is synchronized with the injected optical signal" (Abstract).

11. **Claims 3-4, 6, 13-14, and 16** remain rejected under 35 U.S.C. 103(a) as being unpatentable over Koichi in view of Heffner and further in view of Mourou US Patent 4,347,437 (hereinafter referred to as Mourou).

12. **For claim 3**, the previous combination remains applied as above.

13. The previous combination does not teach the time-offset application of the electrical control and auxiliary control signals is effected by suitably selecting the electrical propagation times of the control signal and of the auxiliary control signal to the main and auxiliary lasers.

14. However, Mourou does teach consideration of electrical propagation times when determining time delays (column 12, line 67 - column 13, line 3).

15. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to consider the electrical propagation time according to Mourou when synchronizing the optical signal and exciting signal according to the previous combination.

16. **For claim 4,** Koichi teaches the electrical control signal and the auxiliary control signal are generated by the same signal generator ("an electrical signal input terminal", 1), the signal generator being connected to the main laser via a first drive line (through 1, 2, and "2nd driving circuit" 7), and to the auxiliary laser via a second drive line (through 1, 2, and "1st driving circuit" 3) (Abstract).

17. **For claim 6,** the limitation "the length (L1) of the first drive line (20) is selected in such a way that the propagation time of the control signal (St) to the main laser (30) is of the same magnitude as the propagation time sum resulting from addition of the propagation time required by the auxiliary control signal (HSt) to the auxiliary laser (50) via the second drive line (40) and the propagation time required by the optical injection pulse (I) from the auxiliary laser (50) to the main laser (30)" restates the requirement taught by Koichi that "the exciting signal of the laser is synchronized with the injected optical signal" (Abstract).

18. **For claim 13,** the previous combination does not teach the time-offset application of the electrical control and auxiliary control signals is effected by suitably selecting the electrical propagation times of the control signal and of the auxiliary control signal to the main and auxiliary lasers.

19. However, Mourou does teach consideration of electrical propagation times when determining time delays (column 12, line 67 - column 13, line 3).

20. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to consider the electrical propagation time according to Mourou

when synchronizing the optical signal and exciting signal according to the previous combination.

21. **For claim 14,** Koichi teaches the main laser (label 6) and the auxiliary laser (label 5) are connected to the same signal generator ("an electrical signal input terminal", 1) via a first drive line (through 1, 2, and "2nd driving circuit" 7) and via a second drive line (through 1, 2, and "1st driving circuit" 3), respectively, said signal generator generating the electrical control signal for the main laser and the auxiliary control signal for the auxiliary laser.

22. **For claim 16,** the limitation "the length of the first drive line (20) is selected in such a way that the propagation time of the control signal (St) to the main laser (30) is of precisely the same magnitude as the propagation time sum resulting from addition of the propagation time required by the auxiliary control signal (HSt) to the auxiliary laser (50) via the second drive line (40) and the propagation time required by the optical injection pulse (I) from the auxiliary laser (50) to the main laser (30)" restates the requirement taught by Koichi that "the exciting signal of the laser is synchronized with the injected optical signal" (Abstract).

23. **Claims 5 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Koichi in view of Heffner and Mourou and further in view of Basting et al. US Patent 6,005,880 (hereinafter referred to as Basting).

24. **For claims 5 and 15,** the previous combination remains applied as to claim 3 above.

25. The previous combination does not teach the control signal and the auxiliary control signal are generated by two synchronized signal generators, one signal generator being connected to the main laser via a first drive line and the further signal generator being connected to the auxiliary laser via a second drive line.

26. However, Basting teaches using two separate signal generators ("excitation circuits", column 1, lines 27-28) for driving two separate lasers (column 1, lines 23-25) in order to be able to adjust relative timing using synchronized triggers.

27. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the two generators in Basting with the device of the previous combination in order to be able to adjust the relative timing of pulses.

28. **Claims 7 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Koichi in view of Heffner and further in view of Braiman et al. US PG Pub 2003/0103534 (hereinafter referred to as Braiman).

29. **For claims 7 and 17**, the previous combination remains applied as above.

The previous combination does not teach the optical injection pulse of the auxiliary laser is fed into the main laser via an optical splitter, and the optical laser pulse of the main laser is coupled out via said optical splitter.

However, Braiman teaches using a splitter to couple light into a laser as well as coupling light out (figure 1, label 30).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the beam splitter in Braiman with the device in the previous combination in order to provide a coupling means for the auxiliary laser.

30. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Koichi, in view of Heffner and further in view of Hakimi et al. US PG Pub 2002/0015206 (hereinafter referred to as Hakimi).

31. **For claim 10,** the previous combination does not teach a multiplicity of optical laser pulses are generated in the manner described.

32. However, Hakimi does teach a multiplicity of optical laser pulses are generated in for use in optical communications (paragraph 5).

33. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the device of the previous combination to create a multiplicity of pulses for use in optical communications.

Conclusion

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL CARTER whose telephone number is (571)270-1872. The examiner can normally be reached on Monday-Friday, 7:00 a.m.-4:30 p.m., EST.

35. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

36. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MC/

/Minsun Harvey/
Supervisory Patent Examiner, Art Unit 2828